

In the Claims

Please add new claims 86-92 as follows:

Sub C2
86. An integrated circuit for implementing a current-mode switching voltage regulator circuit by connecting the integrated circuit to external components, the integrated circuit comprising:

at least an input terminal and a ground terminal for connecting the integrated circuit to a source of input voltage and current, an output terminal for connecting the integrated circuit to an external inductive or transformer load, a feedback terminal for receiving an external feedback signal proportional to the regulated output voltage of the switching regulator, and a compensation terminal for connection to an external frequency compensation network;

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a power switching transistor structure coupled to conduct current between the output terminal and the ground terminal;

a circuit coupled to the switching transistor structure for varying the on and off duty cycle of the switching transistor in response to a control signal;

a circuit, including a resistive element coupled in series with a current path in the switching transistor structure between the output terminal and the ground terminal, for generating a current sense signal indicative of the current conducted by the switching transistor;

a circuit for generating an error signal indicative of a difference between the feedback signal and a reference signal, and for coupling the error signal to the compensation terminal;

a circuit for comparing the current sense signal to the error signal and for generating the control signal to turn

off the switching transistor when the current sense signal compares in a predetermined way to the error signal to vary the duty cycle of the switching transistor to produce the regulated voltage, said comparing circuit further being responsive to control signals externally applied to the compensation terminal for performing at least one of (a) limiting peak current conducted by the switching transistor, and (b) variably limiting current conducted by the switching transistor as a function of time; and

a circuit, responsive to a control signal externally applied to a shutdown terminal of the integrated circuit, for placing the integrated circuit into a shutdown state where the current drawn by the integrated circuit is reduced.

87. The integrated circuit of claim 86, wherein the shutdown terminal is the compensation terminal.

88. The integrated circuit of claim 86, wherein the switching transistor structure is a bipolar transistor.

89. An integrated circuit for implementing a current-mode switching regulator circuit by connecting the integrated circuit to external components, the integrated circuit comprising:

at least an input terminal and a ground terminal for connecting the integrated circuit to a source of input voltage and current, an output terminal for connecting the integrated circuit to an external inductive or transformer load, a feedback terminal for receiving an external feedback signal proportional to the regulated output voltage of the switching regulator, and a compensation terminal for connection to an external frequency compensation network;

a power switching transistor structure coupled to conduct current between the output terminal and the ground terminal;

a circuit coupled to the switching transistor structure for varying the on and off duty cycle of the switching transistor in response to a control signal;

a circuit, including a resistive element coupled in series with a current path in the switching transistor structure between the output terminal and the ground terminal, for generating a current sense signal indicative of the current conducted by the switching transistor;

a circuit for generating an error signal indicative of a difference between the feedback signal and a reference signal, and for coupling the error signal to the compensation terminal;

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Cont.

a circuit for comparing the current sense signal to the error signal and for generating the control signal to turn off the switching transistor when the current sense signal compares in a predetermined way to the error signal to vary the duty cycle of the switching transistor to produce the regulated voltage, said comparing circuit further being responsive to control signals externally applied to the compensation terminal for (a) limiting peak current conducted by the switching transistor and (b) variably limiting current conducted by the switching transistor as a function of time.

90. The integrated circuit of claim 89, further comprising:

a circuit, responsive to a control signal externally applied to a shutdown terminal of the integrated circuit, for reducing the current drawn by the integrated circuit to place the integrated circuit into a shutdown state.